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SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE

Space Chimp Champ
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A SCIENCE SERVICE PUBLICATION

METEOROLOGY

Winter Getting Warmer

➤ WINTERS ARE NOT getting colder but warmer, despite some unusually cold weather experienced in many parts of the United States, the weatherman says.

Climatologist of the U. S. Weather Bureau, Lothar A. Joos, reported that the changes in winter temperatures are minor, but records of the last 50 to 75 years show that winter temperatures are now one to two degrees higher. This increase, he said, may be caused by the fact that cities have grown larger and now burn more fuel than earlier.

He said winter "storms" have not been unusual in severity this year. Daily weather maps for all years contain records of series of storms. One common path of winter storms has been from Colorado to Ohio. This generally means rainfall as the storms move, but if a north wind sets in, it snows instead.

The cold weather experienced in many parts of the U. S. is caused by storm tracks that this year have come from areas farther south than usual. Texas, southern New Mexico, Oklahoma and Kansas have had wet, cold weather, three to four degrees below the normal average.

Very dry, cold weather of two to four degrees below normal has been common in Nevada, Utah, southern Idaho, western Arizona and southern California.

The Atlantic states from New York to northern Florida have seen more snow than usual and temperatures of six to eight degrees below normal in December and three to seven degrees colder than normal in January.

However, this has not been a hard winter for a large part of the central U. S. where less snow than normal has occurred. Temperatures in January have also been quite high in the Rockies, Montana, Wyoming, the Dakotas and surrounding area where temperatures have averaged 14 to 18 above normal.

• Science News Letter, 79:82 February 11, 1961

ASTRONAUTICS

NASA Chief Appointed

➤ PRESIDENT John F. Kennedy has appointed James Edwin Webb, former director of the Bureau of the Budget and Under Secretary of State under President Truman, to head the National Aeronautics and Space Administration.

Mr. Webb now directs the McDonnell Aircraft Corporation of St. Louis, Mo., that makes the space vehicle designed for manned space flight under NASA's Project Mercury. The Mercury capsule just carried the chimpanzee "Ham" 155 miles up into space and returned him safely to earth.

The new NASA Administrator will give up his business connections with the McDonnell Corporation as well as other business connections and stock holdings that might conflict with his Federal responsibilities. These yield annually several times the $22,500 he will receive as NASA administrator.

Mr. Webb does not consider the reduction in his income imposed by service in Government "a personal sacrifice." It is a "privilege to serve the Government," he said.

Mr. Webb was chosen by both the President and Vice-President Lyndon B. Johnson, who will head the Administration's space council. He is a long-time friend of Dr. Jerome B. Wiesner, Science Adviser to President Kennedy, who advised him of the President's wish that he head the space agency. His distinguished record as a talented administrator both in Government service and in private business impressed the President.

Until the Senate confirms Mr. Webb's appointment, NASA will be headed by Dr. Hugh Dryden, appointed Acting Administrator by the President. When Mr. Webb is confirmed, Dr. Dryden will resume his former post of Deputy Administrator.

• Science News Letter, 79:82 February 11, 1961

PHYSICS

"Nuisance" Phenomenon

➤ PRACTICAL USES for a "nuisance" phenomenon that has complicated research into photoconductive materials was demonstrated by two New York University physicists.

The phenomenon, known to scientists as the "persistent internal polarization" or P.I.P., can now be used in high-speed memory computers, photography, and energy storage devices, according to Dr. Hartmut P. Kallmann, director of NYU's solid state laboratory, and Dr. J. Tennert, senior scientist.

P.I.P. occurs when luminescent materials, such as the phosphor plates in television tubes, are exposed to radiation. The carriers of electrical energy inside the solid separate and a polarized field is formed, thus storing the energy in the plate.

The effect remains even after the source of radiation is removed, but the stored energy can be released by exposure to light.

This phenomenon has been used at NYU to develop memory apparatus in which fast, intense light flashes are used to read back information in less than one-millionth of a second.

With P.I.P., the NYU physicists said, greater amounts of information can be stored in less space than in present computers. Other advantages over present computers include operation under normal room conditions, and the possibility of even speedier operation with more intense and faster light flashes.

P.I.P. also can be used to widen the range of sensitivity in infrared photography, the researchers found. After intense radiation exposure, such as that from an atomic blast, a P.I.P. plate can be exposed without danger of fogging the film. The P.I.P. effect also can provide safer and simpler dry copying in photocopying machines.

P.I.P. also can be used to store electrical energy for hours, and even days, something that cannot be done with normal capacitators. The energy is stored in the phosphor plate and then recalled by exposure to radiation in the form of ultraviolet, infrared or gamma rays, or electrons.

• Science News Letter, 79:82 February 11, 1961

NATURAL RESOURCES

Fast Action Needed On Water Resources

➤ WATER, WATER EVERYWHERE, and not a drop fit to drink, is what this nation will face if it fails to take immediate action to prevent further pollution of our water resources, Sen. Robert S. Kerr (D.-Okla.) has warned.

"Unless we launch an immediate, all-out effort, our economy will be thwarted, our security undermined, and our national health plagued," the Oklahoma senator, chairman of the Select Committee on National Water Resources declared bluntly, in announcing the final report of the Committee after a two-year study.

The report recommends a 20-year water-saving plan to keep the nation abreast of its present usage of 300 billion gallons daily, expected to nearly double in 20 years.

The five-point program, prepared under his direction, calls for close Federal-State cooperation to prepare and keep up-to-date plans for comprehensive water resource development and management for all major river basins of the United States by 1970.

It also calls for a 10-year, $50 million program for Federal grants to the states for water resource planning; coordination and expansion of Federal scientific research programs dealing with water as well as major improvements in construction of works for water storage and control; a biennial assessment of the water-supply demand outlook for each of the regions of the United States by the Federal Government, and emphasis on flood-plain zoning, the emerging water problems in the water-short areas, the needs for major multiple-purpose reservoirs, and the holding of public hearings on proposed Federal activities in the water resource field.

The Committee report is based on a series of more than 90 studies. It looks ahead to needs in the year 2000, when our water demands will have tripled.

• Science News Letter, 79:82 February 11, 1961

ASTRONAUTICS

Chimp Pioneers Space

A chimp named Ham traveled 420 miles in a Mercury capsule and landed safely. Twelve more sub-orbital flights of animals and men are scheduled before chimp or man orbits.

See Front Cover

➤ SIX OF THE SEVEN MERCURY Astronauts cheered the successful 16-minute sub-orbital space flight of a four-year-old Air Force-trained chimpanzee 155 miles up.

The safe return of the high-flying simian space pioneer, named Ham, recovered from the ocean 420 miles down the Atlantic Missile Range means that one of the Mercury Astronauts will follow the chimp's lead in space very soon.

And the safe sub-orbital launch and return of a man will mean that this part of Project Mercury will have entered an operational stage, thereby vindicating the more than $300,000,000 already invested in the National Aeronautics and Space Administration's program for manned space flight. The estimated cost of finally putting a man in orbit is more than $500,000,000.

The one-ton project Mercury spacecraft that carried Ham aloft is hoisted to the top of its Redstone booster in the left panel on the cover of this week's SCIENCE NEWS LETTER. In the right cover panel is Ham in his space couch before take-off.

The sub-orbital program of Project Mercury includes 12 more flights—unmanned, animal shots and several manned launches. At least two, and probably more, of the seven astronauts will experience the stress of sub-orbital launch and recovery, to test human ability to withstand the additional stresses expected in an orbit in space.

When the 12 flights are successfully completed, a chimp again will blaze a trail in space, this time in orbit, for an astronaut to follow.

The scheduling of the chimp orbital flight will depend, however, on the success of an unmanned orbital launch and recovery. The NASA program has allowed for "so-called failures" in the orbital experiments, both in its unmanned and animal-passenger phases.

At least four or five manned orbital flights are expected to follow the launch and recovery of an orbiting chimp.

Although the Mercury vehicle is designed as an automatic system, the role of the Astronaut aboard will not be that of a passive-observer passenger. His job demands levels of skill similar to those required in flying high-performance aircraft.

With man added to the system, vehicle attitude may be achieved not only by the automatic control but also by three manual control systems. Except for guidance control over the booster, man in space will have control over all aspects of the mission.

His success in orbit will mean that it will be only a matter of time before man will be able to land on and explore the moon and then will come long-range flights to Mars and Venus.

Although instruments can teach man much about space, human observation and analysis remain the best-known of all computer systems. On this basis alone, the large investment to put man in space is well justified, NASA officials said.

• Science News Letter, 79:83 February 11, 1961

ASTRONOMY

Supernova Dies 300 Years

➤ THE GLORIOUS death flash of a supernova—a light brighter than a billion suns—likely is the climax of a 300-year dying process.

This conclusion by Drs. Robert Stabler of the Aeronutronic, Research Operations, Newport Beach, Calif., and Hong-Yee Chiu of the Institute of Advanced Study at Princeton, was reported at the American Physical Society meeting in New York. The theory is based on a study of supernova, the brilliant explosion of a dying star.

It is believed that the heavy elements of the universe are formed inside these stars, then distributed into space by the explosions.

After such an explosion, a misty cloud is formed, which expands a few thousand miles per second.

In about a million years, the cloud may mix with an enriched interstellar hydrogen to form new stars and even a new planetary system. The process that leads to the final explosion has been studied since 1054 A.D., when the Chinese made the first study of a supernova. Several theories have been set forth.

One states that the star collapses because of the disintegration of iron after the star's temperature reaches seven billion degrees. This disintegration requires lots of energy that can be supplied only by gravitational contraction of the star.

F. Hoyle calculated the rate of these contractions and concluded that they lead to the eventual internal collapse. This ignites the nuclear fuels in the exterior of the star and the supernova results.

The 300-year death process is set in motion when the star's temperature rises to the point that the carbon core begins to burn. The star then begins to throw off particles of energy.

Astrophysicists are still uncertain as to the length of time it takes for the birth of the star. However, Drs. Stabler and Chiu have concluded that there is considerably less uncertainty in the length of time for the death.

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METEOR TIPS THE DIPPER—A meteor aglow in the atmosphere passes the Big Dipper in the constellation Ursa Major. The photograph was taken at General Electric Company Observatory near Schenectady, N. Y., with a new optical system that required no time exposure.

INVENTION

Patents of the Week

A device for preventing mid-air collisions, a process for extracting oil reserves locked in oil shale deposits and a method for testing purity of uranium were awarded patents.

➤ A WARNING SYSTEM for preventing mid-air aircraft collisions has been patented.

With the increasing air traffic and speeds of jet planes in modern day travels, pilots must be equipped with the best warning equipment for safe travel. The recent tragic air disaster over New York City in which 135 lives were lost emphasizes the need for an adequate warning system.

The present invention warns pilots of a possible collision by sounding an alarm if two planes are traveling along paths that will meet.

Radio beams are continuously sent out by both planes. A computing device automatically gauges, on the basis of the strength of the received radio signal, the time left before a crash. When the time reaches a dangerous value, the warning alarm is automatically set off.

This warning system, which may be used alone or with other warning systems, greatly reduces the number of false warnings, inventor Richard Y. Miner of Port Washington, N. Y., claims. Many systems now used frequently give warnings even though the danger of collision is not real.

The rights to this patent, No. 2,969,539, were assigned to American Bosch Arma Corporation.

The tremendous oil reserves locked in the oil shale deposits of Colorado, Utah and Wyoming may now be commercially feasible to extract. The oil from these deposits, which is supposedly many times greater than the known petroleum reserves in the continental United States, can actually be separated from the oil shale in place, claims Morgan G. Huntington of Washington, D. C.

Superheated steam is injected into wells, penetrating the dense, compact oil shale along its parallel planes of weaknesses. These parallel planes, which divide the oil shale into layers like pages in a book, are widened further by the wedging action of the pressurized steam. The heat given off by the steam passes through the oil shale layers, vaporizing the hydrocarbons or "oil" locked in the deposit. The oil vapor is trapped by the steam and carried to the surface through several wells tapping the oil shale.

This process was awarded patent No. 2,969,226 and the patent rights was assigned to Pyrochem Corporation.

Unconscious or disabled shipwreck survivors stranded in the ocean can be rescued by a scoop net suspended from a helicopter. The net can be used without sending a crew member down the rescue cable to help the injured person.

The net is lowered into the water by a cable from a helicopter hovering above. A pail, attached to the open end of the net, fills with water, tilting the open end downward. The survivor is scooped into the net and pulled up into the helicopter.

For this invention, David A. Richardson of Broomall, Pa., and Hugh A. McCafferty of Upper Darby, Pa., won patent No. 2,969,210 which they assigned to the Navy.

The late Enrico Fermi and Dr. Herbert L. Anderson, now director of the Enrico Fermi Institute for Nuclear Studies at the University of Chicago, developed a method for testing the "purity" of uranium used in a nuclear reactor. This method, which has been under security wraps since 1945, has now received a patent.

The invention measures the amount of certain uranium impurities that slow down the chain reaction in nuclear reactors. These impurities absorb neutrons, preventing the continuation of the chain reaction. (Neutrons are uncharged nuclear particles used for bombarding the cores of other atoms in nuclear reactors.)

The patent, No. 2,969,307, was assigned to the U. S. Atomic Energy Commission.

Water ski enthusiasts can enjoy their favorite sport without relying on a motor boat to pull them. A unique water ski scooter invented by Richard Vogt of Santa Barbara, Calif., has its own motor for propelling itself over the water's surface.

The motor is attached to the front of the scooter between two parallel floats. A pair of water skis located behind the motor are hinged only at the forward ends so that the skis are free to ride on the water's surface. The patent, No. 2,969,037, was assigned to Curtiss-Wright Corporation.

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INVENTION

Nobel Scientist Praises U.S. Patent System

➤ THE UNITED STATES patent system is an effective aid to scientific progress, Dr. Selman A. Waksman, who won a Nobel Prize for his discovery of the antibiotic, streptomycin, has reported. He pointed to the founding of research laboratories from his own patent royalties as an example.

Dr. Waksman, a professor emeritus at Rutgers University's Institute of Microbiology, said that without patent protection, vast funds for research would almost certainly be cut off.

The present patent system assures the inventor, manufacturer and public that there will be some degree of protection for scientific discoveries and their eventual use, Dr. Waksman reported to the National Association of Manufacturers in Washington, D. C.

He urged that the present patent system be left as is. Congress is now studying possible legislation to change the patent system.

These proposals include shortening the present 17-year life of patents and curbing certain patent rights in the drug field and under Government contracts.

Dr. Waksman also said that the U. S., which offers patent protection, has led the way in the total number of new pharmaceutical products. He compared the situation with Italy, which has no pharmaceutical patent protection, and Russia, where foreign inventors' rights are seldom protected.

These countries copied certain patents at first, but now they realize this procedure actually harmed scientific progress.

• Science News Letter, 79:84 February 11, 1961

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MEDICINE

Relieve Arthritic Joints

▶ CHRONICALLY INFLAMED arthritic joints can be relieved, but not cured, by injecting cortisone-related steroids, or hormone drugs, directly into the joint.

Repeated injections, up to 142 times in one case, had no apparently harmful effect, three doctors report in the Bulletin of Rheumatic Diseases, Jan., 1961.

Some 4,000 patients at the University of Pennsylvania Arthritis Clinic, Philadelphia, received more than 100,000 injections during a ten-year period, Drs. Joseph L. Hollander, Ralph A. Jessar and Ernest M. Brown Jr. report. Reduction in swelling and relief of pain was found in 90%.

The physicians state that relief varies and is often temporary. Because the treatment can be repeated in long-term cases of the most serious types of arthritis, rheumatoid arthritis and osteoarthritis, however, it is especially valuable.

The steroid compounds used in the study included hydrocortisone, prednisolone, methylprednisolone, triamcinolone and dexamethasone.

Other forms of therapy must accompany steroid joint injections when severe types of arthritis are treated, the physicians emphasize. They say it is important to keep patients under continued observation and to avoid the drugs when infection in the joint is suspected.

In about seven-tenths of one percent of the cases, instability developed in repeatedly injected weight-bearing joints. Regular X-ray examinations and protection of these joints during steroid injection treatment may help detect and avoid this danger.

• Science News Letter, 79:85 February 11, 1961

MEDICINE

Mouse Leukemia in Rats

▶ FOR THE FIRST TIME, the same virus has caused leukemia, cancer of the blood, in two different kinds of animals.

The malignant blood disease has been produced in rats by the same virus that causes leukemia in mice, Dr. Ludwik Gross of the Veterans Administration Hospital, New York City, reported.

Dr. Gross told a symposium on Frontiers in Cancer Research, held in Boston to celebrate the 150th anniversary of the Massachusetts General Hospital, that he had found different types of leukemia can be caused by the same virus.

The two principal types of leukemia are lymphatic and myeloid. Dr. Gross has discovered that lymphatic leukemia virus could, under certain conditions, produce myeloid leukemia, thus proving that different types of the disease can be caused by the same virus.

Dr. Gross said that the mouse leukemia virus can be grown in tissue culture. In the mouse, it runs in certain families from one generation to another. In many mice it may be latent, but it either can produce leukemia itself or be prompted to produce it as in radiation, or X-ray.

Dr. Gross in 1951 excited the cancer research world with his inoculation of newborn mice with a cell-free extract of leukemia tissue which later was proved to be a virus.

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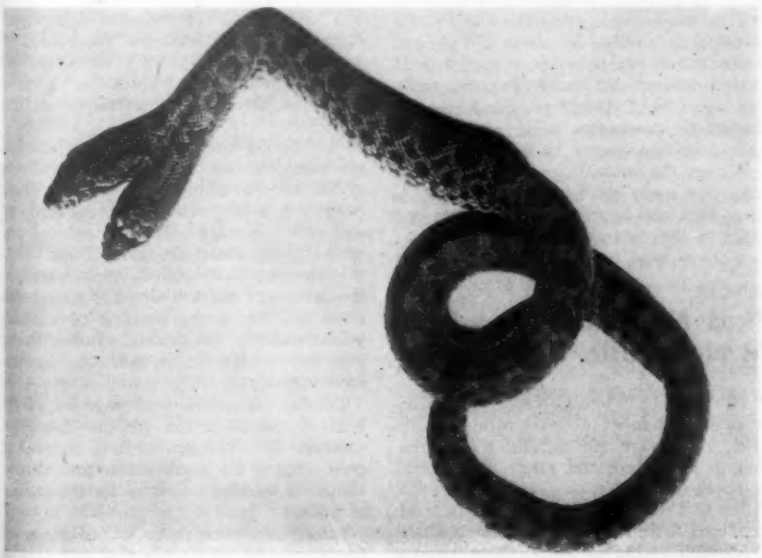

LOOK MA, TWO HEADS—A 14-inch two-headed bull snake, found by a farmer near Delphos, Kans., is being studied by scientists at Kansas State University's Fairchild museum. Heads join about an inch down the spine.

SURGERY

Cotton Sponge Found Instead of Lung Cancer

▶ THE INTACT REMNANT of a cotton gauze surgical sponge was removed from a former soldier's chest cavity after remaining in the upper edge of his right lung for 14 years.

Among the possible causes of the enlarging mass seen in successive X-rays was malignant neoplasm, or cancer, it was reported in The New England Journal of Medicine, 264:172, 1961.

The soldier had been shot while lying in a prone position, in battle in April, 1945. The bullet pierced his right shoulder, traveled through the right chest and passed through his liver, and was removed from the abdominal cavity.

A chest operation was later performed to drain the right lung, after which the series of lung X-rays showed a gradually enlarging dense shadow in spite of the patient's apparent good health.

Reporting the case were Drs. John S. Trombold, Alvin C. McCuistion and H. William Harris, all of the University of Utah College of Medicine and Veterans Administration Hospital, Salt Lake City.

Although it is unlikely that similar cases will be seen in the future because of present use of radiographic sponge markers, the physicians said, an object in the chest cavity must be considered in diagnosing certain patients with an enlarging mass near the edge of the lung.

They said the cause of progressive enlargement of the mass is not known but it "may have been due to progressive fibrosis caused by the gradual breakdown of the sponge and local dissemination of the fibers."

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PUBLIC HEALTH

Farm Health Costs Higher Than All Others

▶ MEDICAL COSTS averaged $92 a year per person for farm families in which farm operators were 65 years of age or older, a nation-wide survey by the U. S. Department of Agriculture and the Bureau of the Census has shown. Medical costs for all others were $59.

These and other findings are reported and analyzed in Agriculture Information Bulletin 235, issued by the United States Department of Agriculture. Copies may be obtained from the Office of Information, United States Department of Agriculture, Washington 25, D. C.

• Science News Letter, 79:85 February 11, 1961

ROENTGENOLOGY

Childhood Arthritis

➤ SPONDYLARTHRITIS, a disease of the spine found in infants and young children, can be diagnosed by X-rays within a week after symptoms occur.

The early diagnosis allows prompt treatment and rapid recovery, Dr. Arthur E. Childe of Children's Hospital, Winnipeg, Can., told the meeting of the Canadian Association of Radiologists in St. John, N. B., Canada.

Dr. Childe, who is president of the association, said it is possible that injury may cause this apparently inflammatory illness. Radiologists and physicians specializing in the use of X-ray and radioactive substances in the treatment of disease attended the meeting.

"The first radiological evidence of this disease," Dr. Childe said, "is narrowing of the affected intervertebral disc (in the spine) usually in the lumbar region. This sign may be seen as early as one week after the onset of symptoms."

Dr. Childe said spondylarthritis must be "differentiated from tuberculosis and osteomyelitis." He said the "radiographic findings and clinical course are remarkably constant. No matter what form of treatment is carried out clinical recovery occurs rather rapidly and it is permanent."

Blood Pressure Diagnosis

Drs. Burt B. Hale and Frank A. Grainger of the Royal Victoria Hospital in Montreal told the meeting radiologists can contribute valuable information in diagnosing high blood pressure originating in the kidney.

The scientists said that X-ray study of the main thigh artery after opaque material has been injected directly into the artery had value, with X-ray films being made at intervals to record the flow of the material in the channel of the artery and its side vessels. This is known as "percutaneous transfemoral aortography," and has opened up a new field of treatment.

The physicians said other applications of transfemoral aortography they have employed include a differentiation of benign from malignant tumors as a result of investigating expanding kidney lesions.

• Science News Letter, 79:86 February 11, 1961

PSYCHIATRY

Drugs for Mental Anxiety

➤ MILD DEPRESSION or anxiety states can be helped in a matter of days by certain tested drugs.

These patients do not have severe cases of melancholia so easily recognizable and referred for psychiatric treatment, Dr. William Sargant of St. Thomas's Hospital, London, Eng., reports. But although mild depression may not drive victims to insanity, it often results in suicide.

In the British Medical Journal, Jan. 28, 1961, Dr. Sargant states the numerous depressed patients discharged from hospitals with the "reassurance" that nothing is wrong with them go away feeling more hopeless than ever.

The fatal toll of suicides in Great Britain has risen to more than 5,000 a year and is rising annually, Dr. Sargant said. Large numbers of the suicides are "just such depressed patients, who have already been seen by doctors, and who have obtained so very little help from them that suicide seems the only way out of their problems and suffering."

Depressive illnesses are now the most easily treatable and have the highest potential for recovery of all types of mental illness, he said.

But, Dr. Sargant cautioned, drug manufacturers often advertise foolish and absurd claims for cases of depression in which the new drugs are unsuitable and may only increase the "grave risks of suicide always present in severe depressive illnesses."

Drugs tested at St. Thomas's Hospital and recommended for depressed patients who may be anxious or hysterical include the monoaminase inhibitors phenelzine, or Nardil, and isocarboxazid, or Marplan.

Dr. Sargant said iproniazid, or Marsilid, is even more effective but the danger of a severe toxic jaundice in one in 250 patients makes it undesirable except in special cases.

He predicted that many of "our present-day specialized psychiatric and psychotherapeutic treatments will become more and more unnecessary in the future."

Within the next 25 years, Dr. Sargant said, very many more patients will be able to go back and be treated quite simply and easily by the general practitioner.

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MEDICINE

Find Moderate Paralysis In Non-Polio Infections

➤ NOW THAT VACCINATION has decreased the number of severe paralytic polio cases, researchers are turning their attention to less severe and rarely encountered non-poliovirus infections causing paralysis.

But Drs. Robert L. Magoffin, Edwin H. Lennette, Arthur C. Hollister and Nathalie J. Schmidt of the California State Department of Public Health report in the Journal of the American Medical Association, 175:269, 1961, that in a study of 358 patients originally diagnosed as having paralytic polio, they found no non-poliovirus infections associated with severe paralysis.

The scientists said that their findings indicate that widespread immunization with poliovirus vaccine has made the occurrence of paralytic illnesses caused by non-polioviruses more apparent. This does not mean such illnesses are increasing, however.

In the study reported, a non-poliovirus was implicated in 41 cases in which the possibility of a concurrent poliovirus infection was ruled out or appeared to be unlikely.

The non-polioviruses included Coxsackie B2, B4 and B5; ECHO (enteric cytopathogenic human orphan), type 6 and unidentified types; mumps virus; herpes simplex virus; St. Louis encephalitis virus.

"These findings provide further evidence," the investigators said, "that infection with any of a number of viruses may produce a meningomyelitic illness clinically resembling mild paralytic poliomyelitis."

• Science News Letter, 79:86 February 11, 1961

PUBLIC HEALTH

Recommendations Made For Control of Polio

➤ FOURTEEN recommendations for the control of poliomyelitis were submitted to the Surgeon General of the Public Health Service by his advisory committee at the conclusion of its two-day meeting at the Service's Communicable Disease Center in Atlanta, Ga.

Eight of the recommendations concern more intensive use of the Salk, or formalin-inactivated, vaccine now available to prevent polio during 1961. Six deal with programs for the future after oral vaccine becomes available.

The advisory committee included representatives of the public health and medical profession and the general public.

A "Babies' and Breadwinners' Campaign," referring to the need for vaccination of young children under six years of age and to the plan for local community drives to reach the lower socio-economic levels, was endorsed.

Among the immediate steps to be taken are intensification of the vaccination program with available Salk vaccine. First priority is to be given to attaining complete and early coverage of the infant and preschool group under six years of age.

Each state and local health department should accept responsibility for seeing that there is effective organization of medical, public health, educational and citizens' resources within its jurisdiction, the recommendations state.

Further research is recommended in the field of inactivated as well as live virus vaccines. It is planned to have reserves of polio vaccine for epidemic use and to give assistance to other countries for the control of polio.

Efforts are to be made to provide more potent inactivated vaccine that will require fewer doses.

Dr. Salk has been doing research aimed at one shot only.

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BIOCHEMISTRY

Enzyme Molecules Vary

▶ SIMILAR ENZYMES from different species of animals show variations in molecular structure, Dr. John Paul of Glasgow University, Glasgow, Scotland, has reported.

New techniques for studying these variations may show even greater differences than yet discovered, Dr. Paul told a New York Academy of Sciences conference in New York. With his co-worker, Dr. P. F. Fottrell, he has studied several kinds of enzymes from different animals.

Enzymes are materials that speed up chemical reactions, such as digestion of foods, in plants and animals.

In some animals, Drs. Paul and Fottrell found, the total array of isozymes (the molecular varieties of an enzyme that can be separated) may not be present in all organs. However, only occasionally did they observe enzymes that were specific for a certain organ.

"On the other hand," Dr. Paul said, "each species pattern differed characteristically from every other."

They concluded, therefore, that certain enzymes may be distributed "throughout the biosphere in an enormous variety of molecular forms."

The findings "suggested that many enzymes may contain at least one important area in which the molecular structure cannot vary without alteration of function." They also suggested that the enzymes contain other areas that can be regarded as unimportant, where molecular variation is compatible with retention of function.

In this way the functional properties of a protein may be kept intact by selection while "species-specific structural variations can develop," Dr. Paul said.

Dr. Felix Wroblewski, chief of medical enzymology at Sloan-Kettering Institute, New York, was co-chairman of the three-day conference on multiple molecular forms of enzymes. He said that recognition of the common occurrence of multiple forms is new.

The two newest techniques used to separate different enzyme molecules having the same catalytic activity are electrophoresis and chromatography, which have previously been used for separation of other substances. The first method involves the separation of charged particles by an electric field. The second involves the separation of molecules by adsorption.

• Science News Letter, 79:87 February 11, 1961

PUBLIC HEALTH

Increase in Fallout

▶ RADIOACTIVE FALLOUT levels in man and foods have shown a continued increase in the past two years, the Atomic Energy Commission's 1960 report to Congress disclosed.

The increase has continued despite the general decline in fallout since tests of nuclear weapons were stopped in 1958. The fallout increase has apparently resulted from the accumulation of longer-lived contaminating elements from both weapons testing and nuclear development. The elements are retained in the bone of man and animals, in soil and in plants. However, the levels still are well within acceptable limits, AEC biologists have stated.

AEC studies on contamination levels have concentrated primarily on strontium-90 because it is believed to cause leukemia and bone cancer and tends to concentrate more heavily in the bones of children. The studies have also concentrated on carbon-14, because of its genetic effects sometimes resulting in malformations and other defects; and cesium-137, because it is easy to measure and thus provides confirmatory data on strontium-90.

The average level of strontium-90 in the bones of adults in the Northern Hemisphere has shown a 50% increase since 1958, the AEC report said. This was one-seventh the level of concentration shown in one-year olds in 1958.

Levels of strontium-90 in wheat and milk have also risen. However, milling in wheat and processing in milk can reduce these substantially, the report said.

Carbon-14 activity in the troposphere, that part of the earth's atmosphere in which weather phenomena occur, has increased by as much as 27% in the Northern Hemisphere and 20% in the Southern Hemisphere, according to measurements taken in mid-1959. This increase is considered significant by AEC biologists, and has aroused concern among some geneticists.

Recognizing this concern and the general public fear of fallout, the Commission has proposed to Congress that future weapons tests be conducted underground. In its report, the AEC approves the national policy of "attaining cessation of nuclear weapons tests under a treaty that would establish international controls adequate to assure compliance with its provisions." But it warns that "a continued unpoliced moratorium on weapons testing" threatens United States supremacy in nuclear weapons and the safety of the free world.

Further weapons testing would achieve major advances in nuclear weapons design, the report said.

In the industrial field, the AEC underscores advances in development, including 23 civilian power reactor prototypes under design and construction by mid-1960; operation of the first field power plant for the military services at Camp Century, Greenland; and an increase in recovery of irradiated scrap, representing a saving of almost half a million dollars.

There are now 66 civilian and military power reactor projects in the U. S., not including naval propulsion, aircraft and space reactors.

• Science News Letter, 79:87 February 11, 1961

PEEK-A-BOO—A hog, exposed to radiation near an atomic blast, has its eyes checked at the University of Tennessee-Atomic Energy Commission Agricultural Research Laboratory, Oak Ridge, Tenn. The hog was placed near an atomic explosion during the weapons tests at the Nevada test site. Veterinarians found it in good health, with no appreciable eye damage caused by the exposure.

PHARMACOLOGY

Study Drug Effects On Mental Patients

▶ WHICH OF SIX representative drugs being used in the treatment of schizophrenia, or split personality, are most suitable will be the subject of a 24-week study in 36 Veterans Administration hospitals. More than 500 newly admitted schizophrenic patients will be studied.

The drugs, all of which have tranquilizing effects, are chlorpromazine, fluphenazine, reserpine, thioridazine, chlorprothixene and triflupromazine.

The study is part of the VA's continuing cooperative research program to evaluate newer drugs in the treatment of mental illness.

It is the sixth project of this kind in VA hospitals since the program started four years ago.

• Science News Letter, 79:87 February 11, 1961

MEDICINE

Water on Brain Due to Faulty Choroid Plexus

➤ HYDROCEPHALUS, or water on the brain, may be due, in part, to a choroid plexus that does not function properly.

The choroid plexus is a slender, lobed structure that extends into the hollows of the brain. It contains interlaced blood vessels and is covered with the same special type of cells found in the central canal of the spinal cord.

Drs. Virginia M. Tennyson and George D. Pappas of Columbia University's College of Physicians and Surgeons, New York, reported that the choroid plexus appears to have a dual role. It secretes cerebrospinal fluid, a function that matures after birth, and it absorbs certain substances from the hollow spaces of the brain, a function present at all ages.

Dr. Tennyson told doctors attending a symposium on congenital malformations in Oklahoma City that in rabbits made hydrocephalic by vitamin A deficiency, certain irregularities appeared in the nuclei of the cells in the choroid plexus itself and a glue-like mat replaced much of the special covering.

There was no indication that the plexus was secreting abnormal amounts of fluid, but reabsorption of at least one substance, thorium dioxide, was greatly decreased in the hydrocephalic rabbits.

Just what these findings mean is a bit uncertain at present, Dr. Tennyson said, because the role reabsorption plays in these cells is not known even in normal rabbits.

• Science News Letter, 79:88 February 11, 1961

STATISTICS

Released Prestige Polls Said to Be Valid Samples

➤ THE PRESTIGE POLLS showing that the "standing of the United States is at a record low" released by the U. S. Information Agency, are considered a valid sample of public opinion in western European and other countries around the world.

George H. Gallup Jr. of the American Institute of Public Opinion, popularly called the Gallup Poll, said the reports just released by the USIA are based on reliable polls since this agency is very careful to obtain the best information available.

He said that polls taken by 22 organizations affiliated with the Gallup Poll through the International Association of Public Opinion Institute in 30 countries and regions use standard procedures for their polling.

Samples are taken from all walks of life, in the proportion they occur in the census figures, and from all parts of a country. Any one person has as much chance to be polled as any other.

Mr. Gallup said that part of the report released by the USIA is based on Gallup polls. One poll asking whether the U. S. or Russia is likely to be ahead militarily or scientifically in ten years showed that a plurality believed Russia would be ahead.

In another Gallup poll taken, major European countries believed that U. S. prestige had declined. Only in cities such as Athens, Madrid, Saigon and Manila has U. S. prestige increased during the past year.

In a Gallup poll taken recently in the U. S. asking if Americans believed U. S. prestige had increased or decreased, 22% believed it had increased, 45% believed it had decreased, 23% thought it was the same, while 10% had no opinion.

When asked if he believed or knew of any evidence that showed that anyone was influenced by polls to change his mind, Mr. Gallup said he did not. He quoted the classical example of the prediction by Gallup and other pollsters of the presidential victory by Dewey in 1948. Although the polls kept predicting the Dewey victory, no one seemed influenced to change his mind and Truman won.

• Science News Letter, 79:88 February 11, 1961

NATURAL RESOURCES

Atomic Clock Measures Desert Water Supply

➤ THE AMOUNT of water available to a thirsty population living in hot, dry climates can be measured by determining the water's age.

Carbon-14 dating of underground water supplies tapped by wells tells scientists how much water can be removed safely without exhausting the supply, K. O. Munnich II of the Physikalisches Institut der Universitat, Heidelberg, Germany, told the combined New York Academy of Sciences and American Meteorological Society meeting in New York.

If the water is young in age, much rain water must be continually seeping into the ground, replenishing the water supply, the scientist said. Older or "fossil" water indicates that the water supply will be quickly depleted because no water in recent years has penetrated to the underground reservoir.

Other sources of water will then be needed, or a planned program for withdrawing water must be started.

The carbon-14 method is the "atomic clock" used for dating objects of geological and archaeological significance. The dating of the Dead Sea Scrolls is one of the accomplishments achieved by the dating method.

• Science News Letter, 79:88 February 11, 1961

TECHNOLOGY

Industrial Research: $9.4 Billion

➤ U. S. INDUSTRY spent $9.4 billion for scientific research and development in 1959, a 15% increase from the previous year, the National Science Foundation reported. More than half of the total, or $5.4 billion, came from Federal funds. In recent years the Government has been spending large sums for research and development programs. Funds for industrial basic research amounted to $344,000,000, or four percent of the total.

• Science News Letter, 79:88 February 11, 1961

IN SCIEN

VOLCANOLOGY

Mt. Etna in Italy Erupts After Six Months Quiet

➤ THE VOLCANO Mt. Etna on the island of Sicily erupted recently.

The Italian Embassy in Washington, D. C., reported that the rumble from the erupting mountain was heard in all the small villages on the sides of the volcano. Incandescent debris was hurled out of the crater at an increasing rate.

Scientists observed a small eruption of lava from a small cone on the northeast side of the main crater in mid-January. This lava slowly descended down the mountain toward the valley Valle Del Leone.

No cycle of eruption is known. If the eruption threatens their homes, the inhabitants usually leave. However, they always come back and rebuild their villages on the same spot again, even if everything has been buried in lava because lava enriches the soil.

The last eruption of Mt. Etna occurred in July, 1960, the largest so far this century.

• Science News Letter, 79:88 February 11, 1961

METEOROLOGY

Satellite Data Aid Weather Forecasting

➤ WEATHER INFORMATION transmitted by satellites will "inevitably" lead to more accurate weather forecasting, the American Meteorological Society reported.

An official statement concerning the effects of weather satellites on the accuracy of weather forecasts was issued by the society in New York because reports have varied so widely.

As satellite observations become a more integral part of weather data, the quality of weather predictions will also improve, the society said. Satellites enable meteorologists to view weather patterns more comprehensively in regions where adequate observations do not exist. However, the society cautioned, satellites report only what is seen; they do not issue forecasts.

Weather predictions for coastal regions will be improved through satellite observations. Although there are many ground stations dotting United States coastlines, virtually no information is available from more than a few miles offshore. Satellite observations can plug up this gap by radioing back information about this uncharted part of the atmosphere.

The ultimate role of the satellite is a research tool in broadening the understanding of the ways in which weather systems develop and move, the society reported.

• Science News Letter, 79:88 February 11, 1961

NE FIELDS

ASTRONOMY

Total Solar Eclipse Occurs on Feb. 15

➤ A TOTAL ECLIPSE of the sun that can be seen in all of Europe, North Africa and most of Asia will occur Feb. 15.

The eclipse begins at sunrise along a line from northern Norway to southern France and North Africa. The entire face of the sun will be covered by the moon at 3:43 a.m. EST.

The path of total eclipse, where the sun will be seen completely covered by the moon, reaches from southern France across central Italy, the Balkan peninsula, and into Russia and Siberia. The eclipse ends at 5:30 a.m. EST.

No part of the eclipse will be seen in the United States. However, it will be of great importance to astronomers the world over as totality will occur in areas where large astronomical observatories are located. Thus direct studies with large optical telescopes can be made.

Yugoslavia newspapers report that the total eclipse will be televised by Eurovision, Western Europe's international TV hookup.

Besides the total eclipse of the sun on Feb. 15, there will be one other solar eclipse in 1961. On Aug. 11, an annular eclipse will occur. In annular eclipses a thin ring of sunlight is visible around the dark moon.

Two lunar eclipses will take place in 1961. On March 2 and Aug. 26, partial eclipses of the moon can be observed. In lunar eclipses, the moon passes through the earth's shadow opposite the sun.

• Science News Letter, 79:89 February 11, 1961

MEDICINE

Oklahoma Doctors Fight Congenital Malformation

➤ AN ALL-OUT WAR on birth defects is planned by medical specialists at the University of Oklahoma School of Medicine, Oklahoma City.

Dr. Harris D. Riley Jr., head of the University's department of pediatrics, said that 250,000 children or one in 16 born each year in this country have significant congenital or birth defects, and about 34,000 infants die each year from these causes. Until recently, Dr. Riley reported, the field of congenital malformations has been almost completely neglected.

At first, the new birth defects clinical study center being set up will concentrate on repairing or relieving defects in which the brain and spinal cord are pushed into places where they do not belong. Such malformations include: encephalocele, protrusion of part of the brain through the skull; meningomyelocele, protrusion of the spinal cord and nerve roots through a bone fault in the spinal column; and Arnold-Chiari malformation, protrusion of parts of the brain into the spinal canal.

One innovation of the program is that all the specialists involved in any one case will see the patient at the same time, to confer with each other and decide on a course of treatment as soon after the infant's birth as possible.

Dr. Lucien Kavan, also of the University of Oklahoma School of Medicine, reported that children with meningomyelocele, for example, almost always have difficulty controlling the urinary bladder and that only in recent years has surgical correction been attempted. One corrective procedure that has had good results is to transplant the urine tube into an isolated segment of the intestine, which is then brought out through the abdomen.

Dr. William L. Waldrop, associate clinical professor of orthopedic surgery, said the child with meningomyelocele also has a tendency toward club feet and that correction cannot be attempted until the patient is five to eight years old.

• Science News Letter, 79:89 February 11, 1961

ANTHROPOLOGY

Picture Test Can Show Difference of Ideas

➤ A NEW WAY of testing how differently people think about the same things is being developed.

Drs. Walter R. Goldschmidt of the University of California, Los Angeles, and Robert B. Edgerton of Pacific State Hospital, Pomona, Calif., are developing the picture test. The idea came from their studies of the differing ideas herders and farmers in East Africa have about such things as what clothes a man should wear.

A series of cards was developed and shown to 44 adult male Menomini Indians of Wisconsin from different cultural levels, the scientists report in the American Anthropologist, 63:26, 1961. Their value test differs from psychological picture tests, which are aimed at evoking fantasy, since the pictures of this test try to simulate reality.

They state that the pictures will have to be re-drawn for each culture to conform with different ideas of behavior and cultural objects. However, the scientists hope to develop a set of value choices that can be translated from one culture to another.

In testing the Menomini, situations were depicted that pertained specifically to their life and culture. Nevertheless, in many cases the subjects misunderstood the situation shown and as a result could not give an "honest" response.

One card shows a car with three men being driven down a road. One man is waving at a girl walking along the road. Two girls are walking behind the girl. This picture was unfailingly thought to be a pick-up scene and as such was condemned by nearly all the subjects. The picture was ment to obtain value judgments on extramarital sexual activity.

• Science News Letter, 79:89 February 11, 1961

PHYSICS

UAR Atomic Reactor Being Built by USSR

➤ THE UNITED ARAB REPUBLIC is building an atomic plant in Cairo with technical and financial support from the Soviet Union, a spokesman from the UAR Embassy reported.

"The reactor is for peaceful use," Mohamed Nagib, a member of the UAR press office, said. The USSR is making the construction possible, he said, but no details were available as to the size or type of the Cairo nuclear reactor.

The information about the reactor is so secret and confidential that "I don't believe any of the details are available to any of our Embassy staff," Mr. Nagib explained.

According to experts in the atomic energy field, the Cairo reactor, like all atomic power reactors, has the capability of producing fissile material used in the production of atomic weapons.

Official concern was expressed by the United States Department of State recently over reports that Israel, with French support, was constructing an atomic plant capable of producing such fissile material. No similar concern has been evidenced by State Department officials over the Russian-built Cairo reactor.

"We have heard the reports about the Cairo reactor; but we have no substantiation of it," State Department press officer, Francis Tully, said.

A nuclear reactor, even one limited in size, is not easily hidden, the State Department spokesman admitted. But when asked whether any of the U. S. embassy or government officials in Cairo had affirmed or denied the existence of the Soviet-built reactor in Cairo, he said, "We have no way of knowing whether this is true or not."

• Science News Letter, 79:89 February 11, 1961

PUBLIC HEALTH

Polio May Be Vanishing In Britain, Figures Show

➤ POLIOMYELITIS, like other killer diseases before it, may be approaching the vanishing point in Britain, as in the U. S. There was a remarkable decline in its prevalence last year.

For the first time in 14 years, the number of cases reported was below 1,000. They totaled 516, with 34 deaths. This compared with 1,326 cases and 86 deaths the year before.

In 1958 there were 2,315 cases with 147 deaths, while ten years ago, in 1950, cases totaled 7,760, with 755 deaths. Ministry of Health and Medical Research Council experts concede that much of the improvement can be attributed to the success of the Salk vaccination campaign.

Further improvement may be looked for in the future because, from the beginning of 1961, vaccination has been available to those more than 40 years of age, and the killed injected vaccine may be later supplemented by the live oral one.

• Science News Letter, 79:89 February 11, 1961

BIOLOGY

Trouble in the Monkey Business

Foreign primate supplies are dwindling. Incidents along shipping routes have caused distrust, and U. S. scientists have plans for home grown monkeys, Gloria Ball reports.

➤ THERE IS TROUBLE brewing in the monkey business.

Medical researchers and drug firms are beginning to wonder where their next monkey shipment is coming from. Smugglers are running a black market trade in orangutans, and not even limited supplies of U. S.-bred primates will be available in the near future.

Of the 182 primate species known throughout the world, the one most thoroughly studied is the rhesus monkey, *Macaca mulatta.* For years the rhesus has been a popular experimental animal; today 60% of the primates used for research are rhesus. The Rh blood factor was found in the rhesus, and this species was a logical choice for the manufacture of poliovirus vaccine.

The monkey supply problem became acute in March, 1955, when supply houses were desperately trying to produce large quantities of vaccine before the summer polio season hit. A shipment of several hundred monkeys accidentally suffocated in London during a flight stopover. Religious sects that regard the monkey as a sacred animal were outraged. Charges of neglect and cruelty were made by officials from India, and all monkey exports were stopped.

Ban Lifted on Monkeys

The ban was lifted only after a United States delegation assured the Indian government that monkeys would be treated with great care in transit and that they would be used only for most noble purposes. The National Institutes of Health must now supply a certificate of need to India on behalf of U. S. researchers requesting a shipment.

The Indian government will not allow NIH to release statistics on the number of rhesus received.

However, estimates have been made for the number of primates used for medical studies and drug production each year in the U. S. The figure is generally quoted as 200,000 to 300,000. Most of these are imported, and a repeat of the 1955 incident could result in a crippling, permanent shipment ban.

Individual firms and the U. S. Government, through NIH, have sent various expeditions abroad to get a first-hand look at the supply situation.

Dr. Alan Creamer, chief of Merck, Sharp and Dohme's veterinary department, visited dealers in Africa, East and West Pakistan, India, Singapore, the Philippines and London in 1958 and toured Africa again in the fall of 1960.

His evaluation is this: 60% of our imported supply consists of rhesus monkeys from India and Pakistan; 30% come from the South Pacific, the home of the cymologus monkey, *Macaca iris;* and 10% are from Africa, where several species of cercopithicus such as the African green monkey can be found along the east coast. A few are from the west coast—Nigeria and Sierra Leone.

India is now and has been the main supply source for years. The figure of 10,000,000 to 20,000,000 was often quoted as the number of monkeys in India or in Uttar Pradesh alone, a north central province in the heart of the rhesus country. Officials in the U. S. decided the figures needed checking.

Dr. Charles H. Southwick, associate professor of zoology at Ohio University, Athens, completed a survey of Uttar Pradesh in June, 1960. The monkeys were everywhere, most of them (76%) in villages, towns and cities. Only 12% were still in the forest areas. But the final projected estimate for the province was only 800,000, a far cry from the millions supposed to be there, and the supply is being depleted rapidly.

To further confuse the international picture, the U. S. unknowingly has become involved in a black market trade in orangutans. The Indonesian Government is extremely strict in limiting exports. But of the 77 orangs now exhibited in U. S. zoos, more than one has arrived with an export permit that later proved to be a forgery. The price may be $2,000 per animal, making a tidy profit for smugglers operating out of Borneo and Sumatra.

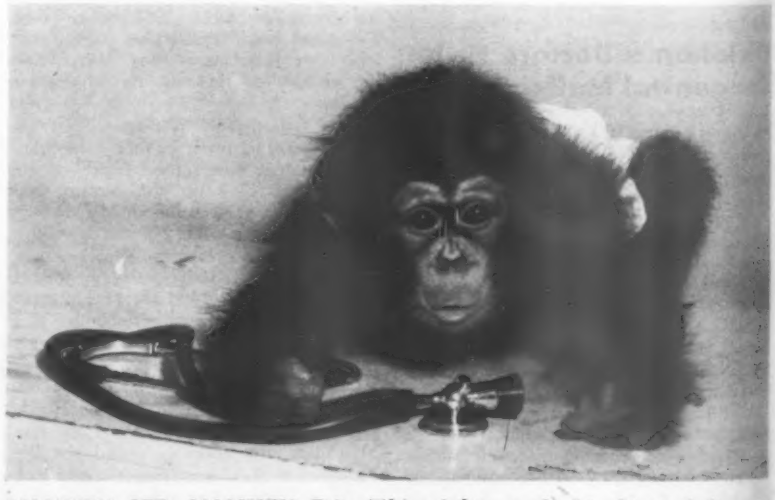
Happily, a new continent is now entering the world market as a supply source: South America. Here the monkeys are more primitive, but their smaller size, as in the case of the spider monkey and the squirrel monkey, makes them particularly suitable for space research.

However, purchasing agents and scientists alike agree that supply colonies should be built up and maintained in or near the U. S. Dwindling reserves in India are not the only consideration. Prices range from $35 to $200 for a rhesus and $300 to $750 or even as high as $2,000 for a chimp, depending on size, condition, source and shipping distance.

Have Breeding Colonies

At present, plans for such a large-scale project in the U. S. are indefinite. Several research groups now maintain breeding colonies to supply enough animals for their own experiments, and outside investigators may be invited to make special studies on the premises.

Breeding primates is a relatively slow business. Dr. Arthur Riopelle, director of the Yerkes Laboratories for Primate Research in Orange Park, Fla., states that the 70 chimps there produce only half a dozen young in a year. The chimp matures at eight and a half years and the gestation period is seven and a half months. How-



MONKEY SEE, MONKEY DO—This eight-month-old chimp helps out during his monthly physical examination. He is part of a blood study project and is one of nearly 300,000 primates used each year in the U. S. for medical research and drug production.

ever, the female can bear young throughout her entire lifetime, which may be 50 or 60 years, for there is no menopause in any primates except humans.

Maximum conditions for setting up a large supply colony are yet to be determined. Data on all types of primate research are being channeled into central information files at the National Academy of Sciences-National Research Council, and new research groups soon will be adding their reports to the common pool.

One of the largest is the $2,000,000 Oregon Primate Center, now under construction at Beaverton, Ore., where Dr. Donald E. Pickering, a pediatrician, will direct studies of some 500 rhesus monkeys.

Future Plans For Colonies

In the future, Dr. Willard H. Eyestone of the primate committee at NIH estimates, it should be possible to establish a breeding colony or colonies large enough to supply 25,000 to 30,000 primates per year. This number would be adequate for basic research purposes but not enough to meet the needs of drug production.

The closest thing to such a colony is Santiago, an L-shaped Puerto Rican island that has been a playground for rhesus monkeys since 1939. Some 300 TB-free animals now range freely over the island's 37 acres and 75 females are in the caged colony. A few are now being released to other institutions, and plans for expansion to two other islands are under consideration.

The main project on Santiago, now cooperatively sponsored by the National Institute of Neurological Diseases and Blindness and the University of Puerto Rico Medical School, is an extensive study of neonatal defects and asphyxia at birth, aimed at finding out why babies are born with cerebral palsy, mental retardation, epilepsy, deafness and blindness.

• Science News Letter, 79:90 February 11, 1961

ROCKETS AND MISSILES

Successful Samos II Is U. S. Eye in the Sky

▶ SAMOS II, an experimental model of the U. S. Air Force's Satellite and Missile Observation System, has been successfully launched.

It now circles the globe in a circumpolar orbit 300 miles away when closest to earth and 350 miles away at the farthest point of its orbit. The period is 95 minutes.

The Samos system is intended for military surveillance, once in operation. However, the Samos II model was launched for the purpose of testing photographic equipment, the Air Force reported.

The perfected system of Samos satellites is planned to radio back to earth photographs of any part of the earth's surface.

The Samos II satellite was launched by an Atlas ICBM first stage with a 22-foot Agena-A second stage rocket from Point Agnello, Calif. The Samos instruments are located in the nose of the Agena rocket.

Samos I, also launched from Point Agnello last October, never went into orbit.

There will be no attempt made to recover the Samos II.

• Science News Letter, 79:91 February 11, 1961

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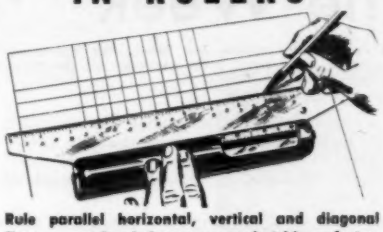

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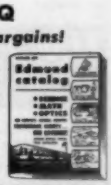

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ABC SCIENCE SERIES: Book 5—Willard J. Jacobson and Cecilia J. Lauby—*Am. Book*, 346 p., illus., $2.92. One of a new series of six elementary science textbooks designed to build up and deepen the interest in and understanding of the six major science areas by stressing experimenting and scientific attitude.

ANNOTATED BIBLIOGRAPHY OF STRONTIUM AND CALCIUM METABOLISM IN MAN AND ANIMALS—R. H. Wasserman and C. L. Comar—*USDA (GPO)*, 135 p., paper, 65¢. Reference source of pertinent published material, classified by major category, with subject and author index.

THE BIRDS AROUND US—Henry Hill Collins, Jr.—*Dial Press*, 63 p., illus. by Vaike Low, $2.50. Adaptation of the Coronet Instructional Films, Birds of the Dooryard and Birds of the Countryside, for young readers.

CHEMISTRY: A First Course in Modern Chemistry—Alfred B. Garrett, John S. Richardson and Arthur S. Kiefer—*Ginn*, 726 p., illus., $5.60. Introductory college text.

THE CONQUEST OF TENSION—Richard H. Hoffmann, M.D., and A. W. Pezet, introd. by William L. Laurence—*Holt, Rinehart & Winston*, 207 p., $3.95. Neuropsychologist analyzes tension as it develops before birth, through infancy, childhood and adolescence, and discusses medical causes of tension.

CULTURE, SOCIETY AND HEALTH—Vera Rubin, Ed.—*N.Y. Acad. of Sciences*, Annals, Vol. 84, Art. 17, 277 p., paper, $3.50. Proceedings of conference organized to promote the integration of medical and social science findings toward increased understanding of the sociocultural factors in chronic organic disease and in mental illness.

ELECTRICAL PRECIPITATION 1959-1960: Seminar Proceedings—Ralph E. Armington, Chmn.—*Pa. State Univ., College of Eng.*, 169 p., illus., paper, $7.50. Papers presented at the Engineering Seminars on Electrical Precipitation, June 1959, and June, 1960, at the Pennsylvania State University.

EXCELLENCE: Can We Be Equal and Excellent too?—John W. Gardner—*Harper*, 171 p., $3.95. Thoughtful discussion of the reasons for the lack of high standards of performance in too many areas of American life, and what can be done to encourage excellence.

GREAT AMERICAN SCIENTISTS: America's Rise to the Forefront of World Science—Editors of FORTUNE—*Prentice-Hall*, 144 p., $3.50; paper, $1.95. Contributions and biographies of forty American physicists, chemists, astronomers and biologists.

A GUIDE TO PRODUCTION, CARE AND USE OF LABORATORY ANIMALS: An Annotated Bibliography—Jules S. Cass, Irene R. Campbell and Lilli Lange—*Fed. of Am. Soc. for Experimental Biology*, Federation Proceedings, Vol. 19, No. 4, Part III, Supplement No. 6, 196 p., paper, $5. Compilation of references that deal with the procurement, production, care and use of laboratory animals.

HOMOLOGY THEORY: An Introduction to Algebraic Topology—P. J. Hilton and S. Wylie—*Cambridge Univ. Press*, 484 p., $14.50. Suitable both as text for senior or post-graduate courses, and as handbook for mathematicians in other branches.

HOW TO USE ALGEBRA IN EVERYDAY LIFE—Fred Reinfeld, Ed.—*Sterling*, 253 p., illus., $3.95. Tries to make clear to the young student and general reader the mathematics underlying mechanical devices and scientific developments in the news.

INTEGRAL QUADRATIC FORMS—G. L. Watson—*Cambridge Univ. Press*, 143 p., $5. Gives "modern, but fairly elementary," account of the theory of quadratic forms with integral coefficients and variables.

THE LIFE AND DEATH OF CELLS—Joseph G. Hoffman—*Doubleday*, 354 p., illus., paper, 95¢. First printed in 1957, this book describes the living process as it is seen in the microscopic realm of tissue cells from the point of view of a physicist.

MATERIALS RESEARCH & STANDARDS, Vol. 1, No. 1—Raymond E. Hess, Ed.—*Am. Soc. for Testing Materials*, 80 p., illus., paper, 75¢; monthly; $5 annually. Formerly published as ASTM BULLETIN from 1921 through 1960.

MESSAGES FROM SPACE—Clive E. Davis—*Dodd*, 95 p., photographs, $2.75. Describes and explains in layman's language the methods used to get back information from sounding rockets and satellites.

THE MISREPRESENTATION OF ARTHRITIS DRUGS AND DEVICES IN THE UNITED STATES: Report—Ruth Walrad—*Arthritis & Rheumatism Foundation*, 168 p., $3.50. Results of a national survey of misrepresented arthritis products which amount to a quarter-of-a-billion-dollar "take" by quack promoters.

MULTIVIBRATOR CIRCUITS: Introduction to Robot Technique—A. H. Bruinsma, transl. from German by E. Harker—*Macmillan*, 65 p., illus. $2. Gives insight into the theory and describes circuits in general terms.

THE ORIGIN OF SPECIES BY MEANS OF NATURAL SELECTION or the Preservation of Favored Races in the Struggle for Life—Charles Darwin—*Doubleday*, 517 p., paper, 95¢. First published in 1859.

POSITIVE HEALTH OF OLDER PEOPLE—Betsy Marden Silverman, Ed.—*National Health Council*, 131 p., paper, $2.25. Quotes authorities who spoke at the 1960 Health Forum, with practical suggestions for action by individuals, industry, the health professions and government.

PRACTICAL ROBOT CIRCUITS: Electronic Sensory Organs and Nerve Systems — A. H. Bruinsma, transl. from German by E. Harker—*Macmillan*, 2nd rev. ed., 125 p., illus., $3.95. Describes in detail the intricate structure of two robot systems developed as demonstration models, one to correspond to sensory organs, the other capable of simple electronic "reasoning."

PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM ON COLD ACCLIMATION, Instituto Antartico Argentino, Buenos Aires, 1959—Robert E. Smith, Ed.—*Fed. of Am. Soc. for Experimental Biology*, Supplement No. 5, Part II, 165 p., illus., paper, $5. Papers and discussions on man in a cold environment, thermogenesis in the acclimated animal, and on intermediary metabolism.

SUMMERHILL: A Radical Approach to Child Rearing—A. S. Neill, foreword by Erich Fromm—*Hart Pub. Co.*, 392 p., $5.75. The founder of Summerhill School in Scotland describes the methods used and their effects on the children, ranging in ages from five to 16.

SYMPOSIA ISSUE: Federation Proceedings, Vol. 10, No. 4, Part I—Edward E. Evarts and others—*Fed. of Am. Soc. for Experimental Biology*, 225 p., illus., paper, $4. Symposia on animal behavior and neurophysiological correlates, gastroenterology, biochemical genetics, metabolic patterns, and new aspects of nutrition uncovered in studies with irradiated foods.

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ROCKETS AND MISSILES

Mobile Radar to Guide Space Vehicles' Return

➤ THE FIRST SPACE vehicles returning from outer space may be guided to a landing by a mobile radar system. This mobile system will provide greater flexibility in the choice of flight paths and landing areas in case of an emergency.

Scientists from Sperry Phoenix Company, a division of Sperry Rand Corporation, told the first International Congress and Exposition of Automotive Engineering meeting in Detroit that they have developed a compact radar system, which may be the forerunner of the actual system to guide the first space vehicle home.

The system, known as the Microwave Aerospace Navigation (MAN) System, is a completely integrated unit that performs the major functions required to guide a vehicle through its re-entry, approach and landing.

The MAN system locates the onrushing space vehicle by radar. After determining its exact position, pulsed radio signals sending coded messages to the space vehicle would then guide it to a safe landing.

The scientists said that the flexibility of the MAN system can be further increased by adding more ground stations or air relay stations for transmitting data to the space vehicle. Max I. Beers, Carl C. Stotz and Richard A. Wallace prepared the report.

• Science News Letter, 79:94 February 11, 1961

Do You Know

New York City has three times as many *automobiles* as France and Germany combined.

The American Cancer Society estimates that 37,500 Americans will die of *lung cancer* in 1961.

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A new instrument for measuring the speed of *sound* in steam under high temperatures and pressures has been developed.

• Science News Letter, 79:94 February 11, 1961

Questions

ASTRONAUTICS—How long was the chimp Ham's ride in the Mercury capsule? p. 83.

BIOCHEMISTRY—What are the two newest techniques used to separate different enzyme molecules? p. 87.

Photographs: Cover, National Aeronautics and Space Administration; p. 83, General Electric Company; p. 85, Kansas State University; p. 87, U. S. Atomic Energy Commission; p. 90, University of Florida; p. 96, Gene O'Fallon and Sons.

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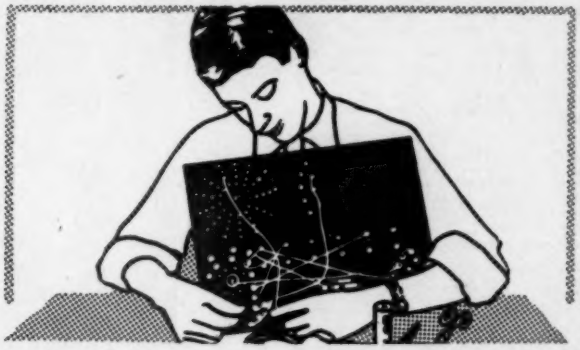

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COLD-WEATHER MASK is patterned after the creations of Peruvian Indians. It is knit of wool with soft synthetic fiber lining about the face. Women's style opens at the top and can be converted to a hood; men's and children's models can be folded up and worn as a stocking cap.

• Science News Letter, 79:96 February 11, 1961

TRANSISTOR RADIO SUNGLASSES, imported from Japan, are precision made with optically ground and polished lenses. Set in the frame is a three-transistor circuit radio. Powered by a dime-sized Mercury battery with a 150-hour lifetime, the radio has a frequency range of 540 to 1600 kc. The set includes a plug-in antenna for use in moving vehicles.

• Science News Letter, 79:96 February 11, 1961

SHOE CLEANER is said to clean all shoes regardless of color, fabric or leather, including light suedes. It even removes mud and salt marks that, according to manufacturer, no other shoe cleaner does.

• Science News Letter, 79:96 February 11, 1961

HOME GYMNASIUM for children from two to nine is supplied by new double-wheel toy, shown in the photograph, in which children can ride, and turn in both backward and forward. Inside the wheel,

securely seated, a child can roll on the ground. Weighing only 23 pounds, the wheel is completely portable and can be played with in the house as well as outside, with minimum supervision.

• Science News Letter, 79:96 February 11, 1961

TOOTHBRUSH NAMEPLATES of polished gold tone or sterling silver will end toothbrush mix-ups. The nameplates, engraved in block letters, can be attached to the end of each toothbrush with three rubber bands and will not move. They are available in sets of four or six.

• Science News Letter, 79:96 February 11, 1961

SHAMPOO HOLDER AND BRUSH dispenses shampoo as pressure is applied while 80 polyethylene bristles work lather into scalp and hair. Available in choice of colors, it also may be used between shampoos to massage the scalp.

• Science News Letter, 79:96 February 11, 1961

DECORATED KITCHEN TOOLS of stainless steel with early American design molded into the plastic handles are dishwasher safe. Tools include mashers, ladles, three-pronged forks, spatulas, solid or slotted turners, spoons and hamburger turners. They can be purchased individually or in a gift set of six tools and hanger.

• Science News Letter, 79:96 February 11, 1961

TIRE GAUGE-KEY CASE combination gives the motorist a handy tire pressure gauge as well as a case for three keys. The gauge is calibrated to permit instant readings of tire pressures from 16 to 40 pounds. The plastic, compact case measures 2½ by 1¼ inches, and especially designed clips hold keys firmly.

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Nature Ramblings

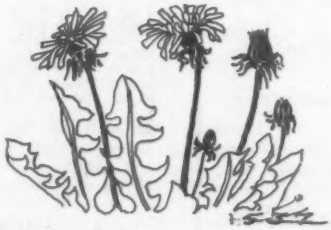
WEEDS HAVE BEEN DEFINED as "plants out of place," and no plant is more noticeably out of place than a lawn weed.

Of the 30 some kinds of weeds commonly found in lawns, about a dozen are grasses: smooth crab grass, hairy crab grass, goosegrass, sandspur, yellow foxtail, quackgrass, tall fescue, dallis grass, Bermuda grass, nimblewill, creeping bentgrass and nutgrass. The first five are annuals and the rest perennials.

Some, such as dallis grass, are rather easily controlled by pulling up the plant. Creeping bentgrass, on the other hand, can be cultivated into a luxury turfgrass if care is taken to protect it against disease and hot, dry weather.

The most undesirable weed grasses, however, are those that grow out along the the ground rather than up. Mowing this type of grass leaves the lawn looking as if it had had a bad shave instead of a neat haircut.

Lawn Weeds



One of these outward-growing grasses, Bermuda, is so wiry and difficult to eradicate that it may be advisable to let it take over the front yard and cultivate it as a turfgrass.

The growth of certain broadleaf weeds may be used as a key to faulty soil conditions. Creeping beggarweed, yarrow, spotted spurge and cinquefoil usually mean that the lawn needs fertilizer. The presence of white clover indicates that the specific fertilizer needed is nitrogen.

Sheep sorrel or sour grass thrives in acid soil and can often be put to rout if the lawn is limed in early spring.

A bumper crop of broadleaved plantain may be a sign that the ground is too tightly packed, and the growth of oxalis and knotweed are signs of poor soil in general.

Many lawn weeds persist because attempts to eradicate them are frequently made when they are most obvious, in the summer. Few are susceptible to herbicides at that time of year.

The best time to apply sprays and powders is in the spring or fall, when the plants are young or old.

Even the best known enemy of all, the dandelion, is best controlled when sprayed in early fall when both old plants and new seedlings can be killed. —GLORIA BALL

• Science News Letter, 79:96 February 11, 1961